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EXAMINER

VASISTH, VISHAL V

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/550,764
Filing Date: September 27, 2005
Appellant(s): DARDIN ET AL.

Richard Treanor
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/12/2010 appealing from the Office action mailed 5/11/2010.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

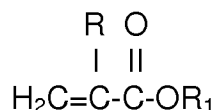
5834408	Mishra	11-1998
3816314	Pappas	6-1974
20040242813	Nesvadba	12-2004
20030060577	Benicewicz	3-2003

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

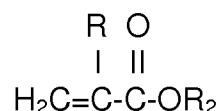
A) Claims 1-14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mishra et al. US Patent No. 5,834,408 (hereinafter referred to as Mishra) in view of Pappas et al., US Patent No. 3,816,314 (hereinafter referred to as Pappas).

Mishra discloses a lubricating oil composition for use in gear oil, hydraulic fluids and motor oils (as recited in claim 17) (Col. 4/L. 55-65) comprising lube oil basestock (a base oil as recited in claim 1) (Col. 5/L. 29-32) and a copolymer additive comprising 0 to 60 wt% of an acrylic monomer (a) of the formula:



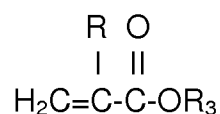
wherein R is hydrogen or methyl, and R₁ is an alkyl group having from 1 to 5 carbon atoms (within the range of carbons as recited in formula (I) of claim 1) (Col. 2/L. 25-30).

Mishra further discloses polymerization of the above monomer with 0 to 60 wt% of an acrylic monomer (b) of the formula:



wherein R is hydrogen or methyl, and R₂ is an alkyl group having from 6 to 14 carbon atoms such as 2-ethylhexyl methacrylate (within the range of carbons as recited in formula (II) of claim 1) (Col. 2/L. 34-40 and Col. 2/L. 63-65).

Mishra also discloses polymerization of the above monomers with 15 to 80 wt% of an acrylic monomer (c) of the formula:



wherein R is hydrogen or methyl, and R₃ is an alkyl group having from 15 to 22 carbon atoms (within the range of carbons as recited in formula (II) of claim 1) (Col. 2/L. 43-50).

The process of Mishra in polymerizing the above mentioned monomers allows for a wide range of copolymers including block copolymers (as recited in claims 1 and 8-9) (Col. 4/L. 9-16 and Col. 4/L. 31-37).

Mishra further discloses monomers that provide further improvements to the performance of the copolymer properties such as dispersancy, antioxidancy and antiwear may also be included in the copolymers of the present invention. Typical performance enhancing monomers of this class include N,N-dimethylamino propyl methacrylamide and N,N-diethylamino propyl methacrylamide (read on formula (III) and claims 2-7) (Col. 3/L. 27-39). The block copolymer of Pappas, can be used in

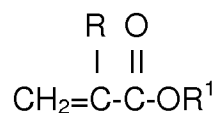
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lubricating oils in amounts from about 0.001 to 1 wt% based on the total weight of the oil (within the range as recited in claim 14) (Col. 5/L. 6-12).

Mishra also discloses additional additives to formulate the finished composition including viscosity index improvers, antioxidants and corrosion inhibitors (as recited in claim 13) (Col. 4-5/L. 66-5).

Mishra discloses monomer with hydrophobic segments and monomers with polar segments. Mishra does not, however, disclose a concentration range for the monomers with polar segments and therefore Mishra does not disclose the lengths of the polar segments or a weight ratio between the two segments. Mishra also does not explicitly disclose weight average degree of polymerization of the hydrophobic or polar segments.

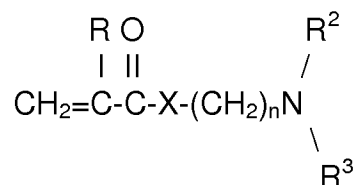
Pappas discloses block copolymers comprising an oil-soluble (hydrophobic) segment and a polar segment (see Abstract). The block copolymer is prepared by block polymerization of a first acrylic comonomer A, and a second nitrogen-containing comonomer B (Col. 3/L. 5-10). Comonomer A is selected from acrylates having the formula:



wherein R is hydrogen or a C₁ to C₄ alkyl group and R¹ is a C₈ to C₂₂ alkyl group.

Comonomer A overlaps with Formula (II) of claim 1 R of comonomer A is hydrogen and so are R⁵ and R⁶ in formula (II) of claim 1 and R⁴ is an alkyl radical having from 6 to 30 carbon atoms (which overlaps with R¹ is a C₈ to C₂₂ alkyl group).

Comonomer B is selected from a group of nitrogen-containing monomers, preferably from acrylic compounds having the formula:



wherein R is as above, X is oxygen or an –NR– group, n is a whole number from 2 to 5, and R² and R³ are each C₁ to C₁₂ alkyl group (Col. 3/L. 36-51).

The block polymers of Pappas comprise from about 99.75 to about 90 mole percent of comonomer A units and from about 0.25 to about 10 mole percent of comonomer B, preferably having a molar ratio of A to B between 99:1 to 95:5. Based on the molar ratio and on the molecular weight of an example of comonomer A (2-ethylhexyl methacrylate) being about 198 g/mol and the molecular weight of an example of comonomer B (diethylaminopropyl methacrylamide) being about 200 g/mol, there are overlapping ranges for components (b) of claim 1 with comonomer A (from 50 to 100 wt%) and the polar segment of claim 1 with comonomer B. Furthermore, Pappas discloses in column 5, lines 20-33 that a block copolymer comprising 5 wt% of comonomer B would actually need 12.5 moles of comonomer B because only a part of comonomer B enters the block copolymer. Based on this number of moles per weight percentage the length of the hydrophobic to polar comonomers would overlap and encompass the range as recited in claim 1. Examiner is also of the position that the length range recited in claim 1 is a result effective variable and that a discovery of optimum value of result effective variable in known process is ordinarily within the skill in

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the art and would have been obvious, consult *In re Boesch and Slaney* (205 USPQ 215 (CCPA 1980)).

The block copolymers of Pappas can be used in lubricating oils (base oil as recited in claim 1), wherein the block copolymer have dispersant regions absorb sludge thereby reducing friction (Col. 5/L. 34-45).

Comonomers A (polar segment D as recited in claim 11) and comonomer B (hydrophobic segment P as recited in claim 10) have an average number of monomeric units in the polymer from about 100 to 3,000 (Col. 4/L. 21-33). Based on the disclosed degree of polymerization and the molecular weight for comonomers A and B as discussed above there is an overlap between the ranges recited and the weight-average degree of polymerization in Pappas. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the length and weight ratio of hydrophobic to polar segments with the designated weight average degree of polymerization in order to achieve a desired molecular weight of the copolymer resulting in sought after physical properties.

B) Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mishra in view of Pappas as applied to claims 1-14 and 17 above, and further in view of Nesvadba et al., US patent Application Publication No. 2004/0242813 (hereinafter referred to as Nesvadba).

Mishra/Pappas disclose all of the limitations discussed above, and Mishra further discloses polymerizing the monomers via anionic polymerization via the use of initiators

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and catalysts that are present in inert environments wherein the temperature useful in producing the copolymers is between -78 °C and about 30 °C. Mishra/Pappas, however, do not disclose polymerization by means of initiators which have a transferable atom group and one or more catalysts having a transition metal in the presence of ligands.

Nesvadba discloses a process for preparing polymers by anionic controlled radical polymerization in the presence of an initiator with a transferable atom group and a transition metal complex catalyst which is complexed and counterbalanced by anionic ligands in an inert solvent thereby forming two segments (Claim 1 of Nesvadba and Para. [0161]-[0162]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the process for preparing polymers disclosed in Nesvadba in preparing the polymers of Mishra/Pappas in order to ensure that the polymers have narrow polydispersity and controlled physical properties (Para. [0001] of Nesvadba).

C) Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mishra in view of Pappas as applied to claims 1-14 and 17 above, and further in view of Benicewicz et al., US Patent Application Publication No. 2003/0060577 (hereinafter referred to as Benicewicz).

Mishra/Pappas disclose all of the limitations discussed above, and Mishra further discloses polymerizing the monomers via anionic polymerization via the use of initiators and catalysts that are present in inert environments wherein the molecular weight distribution is controlled. Mishra/Pappas, however, do not explicitly disclose

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polymerizing monomer compositions in a lubricant oil in the presence of dithiocarboxylic ester.

Benicewicz discloses a free radical polymerization process comprising combining at least one monomer polymerizable by free radicals and at least one transition metal superoxide and a molecular weight controlling agent such as dithiocarboxylic ester (Para. [0007]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use dithiocarboxylic ester in the composition of Mishra/Pappas in order to control the molecular weight of the polymer.

(10) Response to Argument

Appellants' first argument is that Mishra and Pappas are not combinable as prior art references because the polymer compounds in Mishra are used as pour point depressants wherein the polymer compounds disclosed in Pappas are used as viscosity index improvers. Appellants argue that since the two polymers have different functions they also necessarily have different molecular structures. To further buttress appellants' argument, appellants filed an exhibit entitled, "Friction Modifiers, Pour Depressants and Viscosity Improvers" from the Kirk-Othmer Encyclopedia of Chemical Technology. This argument in light of the exhibit is not persuasive. Mishra discloses all of the comonomer components of the independent claims as instantly recited. Mishra does not, however, explicitly disclose the lengths of the polar segments which are the reason for introducing the Pappas reference. Pappas discloses the same block comonomers as those in Mishra and therefore it is the position of the examiner that those comonomer units can

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inherently be used to form copolymers being functional as pour point depressants or viscosity index improvers. Furthermore, Pappas is introduced to modify Mishra solely in terms of comonomer length (number of repeating units) which will be based on function but will also be based on molecular weight distribution which is within the parameters for pour point depressant polymer compounds as recited in Mishra.

Appellants further argue that Mishra does not disclose the block type polar copolymer present in a block of at least three repeating units. The N,N-dimethylamino propyl methacrylamides and N,N-diethylamino propyl methacrylamides disclosed in Mishra can be used along with the other monomer which can be prepared to form block copolymers and one of ordinary skill in the art would envisage that the amine-based methacrylamides could also have at least 3 repeating units from the disclosure of Mishra based on the molecular weight distribution of the polymers disclosed in Mishra.

Appellants also argue that inclusion of monomer B according to Pappas "would likely" render the Mishra copolymer ill-suited for its intended purpose. This argument is also not persuasive. Pappas is not being introduced for its disclosure of monomer B. The lengthy discussion above regarding monomer B from Pappas is only intended to show the length of units and establish a molecular weight distribution based on the length of the monomer B and a ratio of monomer units that can be extrapolated therefrom. Mishra discloses all of the monomer units as recited in the independent claims. Furthermore, appellants have not made any showing that monomer B from Pappas if introduced into the copolymer structure of Mishra would necessarily change

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the function or structure of Mishra. Appellants have merely concluded that it would be "likely" for this to occur.

Appellants further argue that claim 4 should be allowed because neither of the Mishra or Pappas references read on this claim. This is not persuasive. The polar monomers disclosed in Mishra namely N,N-dimethylamino propyl methacrylamide and N,N-diethylamino propyl methacrylamide read on claim 4 and therefore have heteroatom to carbon ratios which are within the range as recited in claim 4.

Appellants argument regarding the 35 USC 103 rejections over Mishra in view of Pappas and further in view of Nesvadba is based on the contention that Mishra and Pappas disclose an anionic copolymerization process which is different from what is claimed in the instant application, and that Nesvadba does not remedy this deficiency. This argument is not persuasive. As appellants point out in page 11 of their brief that Nesvadba discloses two methods of copolymerization. From the products recited in Nesvadba it is evident that either process may be used to get the same product, therefore Nesvadba can be introduced to show that either anionic polymerization of free radical initiated copolymerization will yield the same result and one of ordinary skill in the art would immediately envisage the same from the disclosure of Nesvadba with a reasonable expectation of success.

The same argument as discussed above regarding the Nesvadba reference can be applied to appellants' arguments regarding the Benicewicz reference, because appellants arguments regarding the Benicewicz reference were the same as discussed above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Vishal Vasisth

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